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INTERNATIONAL SEARCHING AUTHORITY

PCT

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2004/008683

International filing date (day/month/year)
03.08.2004

Priority date (day/month/year)
11.08.2003

International Patent Classification (IPC) or both national classification and IPC
C07K14/415, C12N15/82, A01H5/00, C12N15/29

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**International application No.
PCT/EP2004/008683**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☒ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☒ in written format
 - ☒ in computer readable form
 - c. time of filing/furnishing:
 - ☒ contained in the international application as filed.
 - ☒ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. II Priority

1. ☐ The following document has not been furnished:

- ☐ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)),
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

- 2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
- 3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
- 4. Additional observations, if necessary:

see separate sheet

**WRITTEN OPINION OF THE
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PCT/EP2004/008683**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
☒ claims Nos. 2 - 43 (all partially)

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 2 - 43 (all partially) are so unclear that no meaningful opinion could be formed (*specify*):
- see separate sheet**
- ☒ the claims, or said claims Nos. 2 - 43 (all partially) are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the whole application or for said claims Nos.
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

- ☐ has not been furnished
☐ does not comply with the standard

the computer readable form

- ☐ has not been furnished
☐ does not comply with the standard

- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See separate sheet for further details

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, Inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1 - 7, 21, 22, 26 - 29, 32 - 43
	No: Claims	8 - 20, 23 - 25, 30, 31
Inventive step (IS)	Yes: Claims	
	No: Claims	1 - 43
Industrial applicability (IA)	Yes: Claims	1 - 43
	No: Claims	

2. Citations and explanations**see separate sheet**

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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**Re Item II
Priority**

The present application appears to be entitled to the priority date. The sequences claimed in the priority document and in the present application appear to be identical.

Re Item III**Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The subject-matter of parts (g), (h), (j), (k), (l) of present claim 8 and the part relating to "a polypeptide encoded by a segment of chromosome or linkage group 6 of *Solanum bulbocastanum* or *Solanum tuberosum* which co-segregates with a marker from Tables 3a or 3b or comprises a replication site or hybridisation site for said marker and which mediates resistance to pathogens of the phylum Oomyceta" is considered totally unclear (Article 6 PCT). Moreover an undue burden is placed on others trying to establish the extent of protection (Article 5 PCT). The deficiencies mentioned above are so severe that a meaningful examination for the mentioned parts of claim 8 appears to be impossible. Consequently, the examination will be limited to the those parts of claim 8 that appear to be clear and supported, i.e. parts (a), (b), (c), (d), (e), (f) and (l).

The same objection applies to present claim 2 and to claims 3 - 7 and 9 - 43 depending on or relating to claims 2 and 8.

2. Present claim 36 relates to a method comprising a compound defined by reference to a desirable characteristic or property, namely to stimulate resistance to a plant pathogen of the phylum Oomyceta (identified by the method of claim 32).
3. The application does not provide support within the meaning of Article 6 PCT or disclosure within the meaning of Article 5 PCT for such a compound. In the present case, the claim so lacks support, and the application so lacks disclosure, that a meaningful examination is impossible.

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4. Independent of the above reasoning, the claim also lacks clarity (Article 6 PCT). An attempt is made to define the compound by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful examination impossible.
5. Consequently the claim is only examined insofar it does not relate a compound as identified by the method of claim 32. The same holds true for dependent claims 37 - 43.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Article 33(2) PCT (Novelty)

1. 1. The following documents (D) are referred to; the numbering is following the order of the International Search Report:

D1 Rossi *et al.*, 1998. PNAS USA 95:9750-9754.
D2 WO-A-9806750 (Keygene)
D3 Milligan *et al.*, 1998. Plant Cell 10:1307-1319.
D4 Zaitsev *et al.*, 2001. AC AY055116
D5 Song *et al.*, 2003. PNAS USA 100:9128-9133.
D6 Bradeen *et al.* Mol. Gen. Genomics 269:603-611.
D7 EP-A-1334979 (Kweek-en Researchbedrijf Agrico B.V.)
D8 van der Vossen *et al.*, 2003. Plant J. 36:867-882

1. 2. It is noted that the sequences disclosed in D1 and D2 do not consist of the sequences depicted in SEQ ID NOs:7 or 9 of the present application. They only show 99.9% identity to said SEQ ID NOs.
1. 3. Documents D1 - D3 disclose sequences that fall within the scope of claim 8 (c) - (l). Claim 8 does not meet the requirements of Article 33(2) PCT. The same holds true for dependent claims 9 - 19 and for claim 20 directed to a polypeptide having Rpi-blb2 activity.

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1. 4. D1 (e.g. paragraph bridging pages 9750 and 9751) and D2 (e.g. page 13, lines 5-18) also disclose transgenic plants that contain the disclosed sequences and thus anticipate the subject-matter of present claims 23 - 25, 30 and 31.
2. **Article 33(3) PCT (Inventive step)**
 2. 1. Present claims 21, 22, 34 - 43 do not contain any feature that would render them inventive over the prior art D1 and D2.
 2. 2. Applicants have chosen to disclaim SEQ ID NOs:7 and 9. These sequences show around 90% identity to the polynucleotide sequences of present claims 1 and 8. Obviously these sequences do not provide the technical effect that forms the basis for the present application, namely the provision of sequences that confer resistance to plant pathogens of the phylum Oomycetes.
 2. 3. Claims 2 (c) - (l) and 8 (c) - (l) nevertheless relate to sequences that show an even lower identity to SEQ ID NOs:7 and 9. The description does not provide credible evidence that these sequences would solve the technical problem. Claims 2 and 8 do therefore not meet the requirements of Article 33(3) PCT. The same holds true for claim for dependent claims 3 - 7 and 9 - 43.
 2. 4. Claim 1 is directed to a method for generating or increasing the resistance of a plant to a(ny) plant pathogen of the phylum Oomycetes comprising increasing the activity of (any) Rpi-blb2 protein in the plant or a tissue, organ or cell of a plant or a part thereof.
 2. 5. The description does once again not provide credible evidence that the claimed method would be effective for any plant pathogen of the phylum by increasing the activity of any Rpi-blb2 protein. Claim 1 does not meet the requirements of Article 33(3) PCT over its entire scope.

Re Item VI

Certain documents cited

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International application No.

PCT/EP2004/008683**Certain published documents**

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
EP-A-1334979	13.08.2003	08.02.2002	-

Document D7 discloses genes and proteins that confer resistance to *Phytophthora infestans*. The Rpi-blb2 protein of the present application seems to possess the same activity. Additionally D7 discloses methods and products employing said sequences. Moreover, the sequences of D7 are derivable from the sequences of the present application as claimed in present claims 2 (d) and 8 (d). Consequently the subject-matter of present claims 1 -43 is anticipated by D7. Said claims do not meet the requirements of Article 54(3) EPC.

This applies *mutatis mutandis* to the genes/proteins that are disclosed in documents D4 - D6. The documents thus also anticipate the subject-matter of present claims 1- 43. Said claims do not meet the requirements of Article 54 EPC.

Re Item VIII**Certain observations on the international application**

1. Claims 2 and 8 have been drafted to contain separate independent technical features (in total **24** different features). They appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness (Article 6 PCT). Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent features makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection (Article 5 PCT).
2. The scope of claim 1 insofar directed to " [...] the activity of **Rpi-blb2** protein [...] c" is considered totally unclear (Article 6 PCT). Moreover, an undue burden is placed on others trying to establish the scope of protection (Article 5 PCT).

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3. Present claim 8 insofar directed to "a nucleic acid molecule expressing a polypeptide encoded by a segment of chromosome or linkage group 6 of *Solanum bulbocastanum* or *Solanum tuberosum* which co-segregates with a marker selected from Table 3a or 3b and which mediates resistance to a pathogen of the phylum Oomyceta" relates to a method defined by reference to a desirable characteristic or property, namely co-segregating with defined markers and mediating resistance to a pathogen. Present claim 8 does not meet the requirements of Article 6 PCT.
4. Present claim 8 is drafted to comprise a disclaimer. Under EPO rules of practice, disclaimers are only admissible if the subject-matter of a claim cannot technically be defined directly more clearly and concisely. This does not seem to be the case for the subject-matter of present claim 8. It appears that the subject-matter could be defined more precisely, so that it does not collide with the sequences of Mi1.1 and Mi1.2, respectively. They show a 90% identity to SEQ ID NOs:1, 3, 5 or 6. Therefore it appears, that the scope of claim 8 could be positively defined without colliding with the sequences disclosed in D1 - D3. The same holds true for present claim 2 and all claims depending on or relating to claims 2 and 8.

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